

- 1    In the claims:
- 2    1.    A method of depositing solder, the method comprising the steps of:
- 3                 providing a substrate that includes a substantially planar surface and a
- 4                 sloped surface adjacent to the substantially planar surface;
- 5                 forming a wettable layer on a portion of the sloped surface; and
- 6                 forming a solder layer on a first portion of the wettable layer.
- 7    2.    The method of claim 1, wherein the providing step comprises the step of:
- 8                 etching the substrate to form the sloped surface.
- 9    3.    The method of claim 2, wherein the providing step further comprises the step of:
- 10                anisotropically etching completely through the substrate to form the sloped
- 11                surface.
- 12    4.    The method of claim 1, wherein the step of forming the wettable layer comprises
- 13                the step of:
- 14                depositing a metal layer as the wettable layer.
- 15    5.    The method of claim 1, further comprising the step of:
- 16                adhering, prior to the step of forming the solder layer, an organic film to
- 17                the substantially planar surface of the substrate.
- 18    6.    The method of claim 5, wherein the adhering step substantially prevents the
- 19                organic film from adhering to the sloped surface of the substrate.
- 20    7.    The method of claim 5, further comprising the step of:
- 21                removing, prior to the step of forming the solder layer, a portion of the
- 22                organic film adjacent to the wettable layer, forming a gap between the organic
- 23                film and the wettable layer on the sloped surface of the substrate.
- 24    8.    The method of claim 7, wherein the step of forming the solder layer comprises the
- 25                step of:
- 26                substantially filling the volume of the portion of the organic film that was
- 27                removed from the organic film with solder paste.
- 28    9.    The method of claim 8, wherein the forming the solder layer step further
- 29                comprises heating the solder paste to about 180°C or less.
- 30    10.    The method of claim 5, wherein the adhering step further comprises adhering the
- 31                organic film to a substantially planar portion of the wettable layer on the
- 32                substantially planar surface of the substrate.
- 33    11.    The method of claim 1, further comprising the step of:

- 1                         forming a coating layer on the wettable layer prior to the formation of the  
2                         solder layer,  
3                         wherein the coating layer prevents the formation of the solder layer on the  
4                         surface of the wettable layer occupied by the coating layer.
- 5     12. The method of claim 11, wherein the coating layer is a non-wettable layer.
- 6     13. A semiconductor device comprising:  
7                         a substrate having a substantially planar surface and an interior sloped  
8                         surface;  
9                         a wettable layer adhered to a portion of the interior sloped surface; and  
10                         a solder layer adhered to a first portion of the wettable layer.
- 11    14. The semiconductor device of claim 13, wherein the wettable layer comprises a  
12                         metal.
- 13    15. The semiconductor device of claim 13, further comprising a coating layer adhered  
14                         to a second portion of the wettable layer.
- 15    16. The semiconductor device of claim 15, wherein the coating layer is a non-wettable  
16                         layer.
- 17    17. The semiconductor device of claim 16, wherein the coating layer comprises a dielectric material.
- 19    18. The semiconductor device of claim 13, wherein the solder layer comprises a tin-  
20                         bismuth compound.
- 21    19. The semiconductor device of claim 13, wherein the solder layer comprises a eutectic tin-lead compound.
- 23    20. The semiconductor device of claim 13, further comprising a rigid organic film  
24                         adhered to a portion of the substantially planar surface of the substrate and  
25                         adjacent to a portion of the sloped surface.
- 26    21. A method of depositing solder, the method comprising the steps of:  
27                         providing a semiconductor substrate that includes a substantially planar  
28                         surface and a sloped surface that has been etched into the semiconductor substrate,  
29                         adjacent to the substantially planar surface;  
30                         forming a wettable layer on a portion of the sloped surface; and  
31                         forming a solder layer on the wettable layer.
- 33    22. The method of claim 21, wherein the step of forming the wettable layer comprises  
34                         the step of:

- 1                   depositing a metal layer as the wettable layer.
- 2   23.   The method of claim 21, further comprising the step of:
- 3                   adhering, prior to the step of forming the solder layer, an organic film to
- 4                   the substantially planar surface of the semiconductor substrate.
- 5   24.   The method of claim 23, further comprising the step of:
- 6                   removing, prior to the step of forming the solder layer, a portion of the
- 7                   organic film adjacent to the wettable layer, forming a gap between the organic
- 8                   film and the wettable layer on the sloped surface of the semiconductor substrate.
- 9   25.   The method of claim 24, wherein the step of forming the solder layer comprises
- 10          the step of:
- 11                   substantially filling the volume of the portion of the organic film that was
- 12                  removed from the organic film with solder paste and heating the solder paste.
- 13   26.   The method of claim 23, wherein the adhering step further comprises adhering the
- 14                  organic film to a substantially planar portion of the wettable layer on the
- 15                  substantially planar surface of the semiconductor substrate.
- 16   27.   The method of claim 21, further comprising the step of:
- 17                   forming a coating layer on the wettable layer prior to the formation of the
- 18                  solder layer,
- 19                   wherein the coating layer prevents the formation of the solder layer on the
- 20                  surface of the wettable layer occupied by the coating layer.
- 21   28.   The method of claim 27, wherein the coating layer is a non-wettable layer.